

CLAIMS

(1) A deployable reflector having:

an integrated system of cables that is foldable, has a polyhedral surface structure made up of triangles in a deployed state, and includes a surface cable system being
5 composed of a cable connecting apices of a plurality of triangles as connecting points, metallic meshes attached to said surface cable system and serving as an electromagnetic reflective surface, and a back cable system connected to said surface cable system by a plurality of tie cables; and

a deployable truss structure that renders said integrated system of cables in a
10 deployed state by applying tension thereto, said deployable reflector characterized in that said deployable truss structure comprises:

a plurality of extendable structures that are connected to a plurality of outer circumference fixing points, respectively, and configured so as to be extendable in an axial direction thereof, said outer circumference fixing points being provided in an outer
15 circumferential portion of said surface cable system at predetermined intervals in a circumferential direction of said surface cable system;

an extending mechanism that applies tension to said surface cable system for deployment by extending said plurality of extendable structures and thereby moving said plurality of outer circumference fixing points in an outward direction of said surface cable
20 system; and

a connectable structure that bridges said plurality of extendable structures and connects portions corresponding to nodes of a buckling mode with portions corresponding to antinodes thereof, said buckling mode occurring in said extendable structures when tension is applied to said surface cable system.

25 (2) A deployable reflector having:

an integrated system of cables that is foldable, has a polyhedral surface structure made up of triangles in a deployed state, and includes a surface cable system being composed of a cable connecting apices of a plurality of triangles as connecting points, metallic meshes attached to said surface cable system and serving as an electromagnetic
5 reflective surface, and a back cable system connected to said surface cable system by a plurality of tie cables; and

a deployable truss structure that renders said integrated system of cables in a deployed state by applying tension thereto, said deployable reflector characterized in:

that said surface cable system comprises an internal surface cable system and a
10 circumferential surface cable system that is connected to an outer circumference of said internal surface cable system; and

that a cable used for said internal surface cable system is high in stiffness and small in a ratio of a length variation to a tension variation, and a cable used for said circumferential surface cable system is lower in stiffness and smaller in a ratio of a tension variation to a
15 length variation than a cable used for said internal surface cable system.

(3) The deployable reflector according to claim 1, characterized in:

that said surface cable system comprises an internal surface cable system and a circumferential surface cable system that is connected to an outer circumference of said internal surface cable system; and

20 that a cable used for said internal surface cable system is high in stiffness and small in a ratio of a length variation to a tension variation, and a cable used for said circumferential surface cable system is lower in stiffness and smaller in a ratio of a tension variation to a length variation than a cable used for said internal surface cable system.

(4) The deployable reflector according to claim 1, characterized in that said connectable
25 structure is cables.

(5) The deployable reflector according to claim 4, characterized by further comprising an accommodating unit that accommodates said cables.

(6) The deployable reflector according to any one of claims 1 to 3, characterized in that said deployable truss structure is provided between said surface cable system and said back
5 cable system.

(7) The deployable reflector according to claim 1, characterized in that a cable used for said tie cables and said back cable system is lower in stiffness and smaller in a ratio of a tension variation to a length variation than a cable used for said surface cable system.

(8) The deployable reflector according to claim 1, characterized in that said surface cable
10 system is configured so as to assume an approximately parabolic surface when deployed.

(9) The deployable reflector according to claim 2 or 3, characterized in that a cable used for said tie cables and said back cable system is lower in stiffness and smaller in a ratio of a tension variation to a length variation than a cable used for said internal surface cable system.

(10) The deployable reflector according to claim 2 or 3, characterized in that said internal
15 surface cable system is configured so as to assume an approximately parabolic surface when deployed.